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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/892,805	06/27/2001	Brian Lee	2001 P 11064US (8055-59)	3544

7590

04/30/2003

Infineon Technologies North America Corp.  
c/o Siemens Corporation  
Intellectual Property Department  
186 Wood Avenue South  
Iselin, NJ 08830

EXAMINER

CYGAN, MICHAEL T

ART UNIT

PAPER NUMBER

2855

DATE MAILED: 04/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/892,805

Applicant(s)

LEE ET AL.

Examiner

Michael Cygan

Art Unit

2855

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 27 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ 6) ☐ Other: \_\_\_\_

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities: at page 9, line 5, "tip 24" is mentioned; however, this should be either "AFM 24" or "tip 26". Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, 9-11, 13, 16, 17, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamanaka (US 6,006,593). Yamanaka discloses the claimed invention, a method of measuring physical properties of LSI (Large-Scale-Integrated Circuit) wafers with a cantilever comprising providing a feature (on a substrate such as a LSI wafer) having features of different elasticity, applying acoustic energy to the wafer by vibrating an AFM tip at an ultrasonic frequency, and scanning the sample wafer with the tip using optical deflection detection to determine the position and elasticity of surface features. See entire document, especially Figures 2,

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3, and 8; column 2 lines 14-29; column 3 lines 7-60; column 4 lines 40-57; column 5 lines 45-52; and column 8 lines 5-13.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 7, 8, 14, 15, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamanaka (US 6,006,593) in view of Mizutani (US 6,304,319 B1). Yamanaka teaches the claimed invention except for aligning the feature with a feature on a mask. Mizutani teaches the application of AFM measurement of surface features on substrates to aligning those features with marks on a mask using movement stages positioning substrate and mask; see column 1, lines 21-27; column 3, lines 41-55; and column 10, lines 46-50. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use mask-substrate alignment steps as taught by Mizutani in the invention taught by Yamanaka to align LSI wafers with masks during processing, since Mizutani teaches that such mask-substrate alignment steps are "common" in the semiconductor manufacture art (see column 1, lines 21-

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27) and thus would provide a desirable application for feature recognition methods.

With respect to AFM resolution of less than 20 nm, it is notoriously well known in the AFM art that features less than 20 nm can be resolved, and it would therefore have been obvious to one having ordinary skill in the art at the time the invention was made to provide an AFM capable of 20 nm resolution.

4. Claims 6, 12, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamanaka (US 6,006,593) in view of Weling (US 5,757,502). Yamanaka teaches the claimed invention except for pattern recognition. Weling teaches the use of optical pattern recognition to decipher the location of a surface feature on an integrated circuit chip in relation to the AFM; see column 7, lines 13-20 and Figure 10. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use pattern recognition as taught by Weling in the invention taught by Yamanaka to locate measured surface features using optical pattern recognition, since this is taught to allow alignment of the AFM probe (which measures sub-micrometer features of a substrate) to absolute x and y coordinates and thus be related to macroscopic features of a substrate.

**Conclusion**

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Quate (US 5,319,977) and Yamanaka (US 5,503,010) disclose ultrasonically vibrated tips detecting surface elasticity. Wafer positioning is disclosed by Kuroda (US 5,508,527), Shiraishi (US 6,538,740 B1), Mih (US 6,407,396 B1), and Ozaki (US 5,331,275).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cygan whose telephone number is 703-305-0846. The examiner can normally be reached on 8:30-6 M-Th, alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on 703-305-4816. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Michael Cygan  
April 28, 2003